

A Second Memoir on Indian Tempests, with reference to the Theory of the Law of Storms.—By HENRY PIDDINGTON.

PART II.

On the 16th November, 1839, an awful hurricane visited Coringa, by which that station was nearly destroyed. I have used my best endeavours to collect all the information possible, and the following, which I have first given in statements and logs, abridged where necessary, and afterwards in the tabular form as before, will shew the results of my labour. It will be seen that we have for this hurricane thirty-two logs and reports, and that we have traced it from near the Great Andaman, in latitude $13^{\circ} 20' N.$, longitude $91^{\circ} 52' E.$ to Coringa and Vizagapatam; our observations extending thus over about 654 miles in five days, and crossing all the Bay of Bengal.

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*Abstract of the log of the Brig "Arethusa," Capt. Chaplin, from Madras to Calcutta. Reduced to civil time.*

11th November, 1839.—At noon lat. obs.  $16^{\circ} 11' N.$ , longitude  $84^{\circ} E.$

12th November.—Increasing breezes EbN. to NE. East and ENE. cloudy weather and rain; almost constant rain or squalls during the night. 6 A. M. squally, heavy and constant rain. 8 A. M. increasing breezes, appearance of an approaching gale. Noon, strong breezes with frequent heavy squalls of wind and rain, wind ENE. sun obscured, latitude  $16^{\circ} 34' N.$ , longitude  $84^{\circ} 20' E.$  strong breezes ENE. to NE. cloudy. 6 P. M. decreasing breeze; at 7. 30 P. M. latitude by star  $16^{\circ} 22' N.$

13th November.—From 9 P. M. to 4 A. M. increasing breezes and sea; dark cloudy weather, and heavy top sea. Wind NEbN. 8 A. M. every appearance of an approaching gale. 11 A. M. a very heavy squall, wind and rain, which hove the brig on her broadside for fifteen or twenty minutes. Noon fresh gale NE. under double-reefed topsails. No observation. Latitude  $15^{\circ} 52' N.$ , longitude  $85^{\circ} 18' E.$ , strong gales NE. throughout with squalls till midnight.

14th November.—At 4 A. M. increasing gale with very high sea, ship labouring and plunging very heavily. 8 A. M. Ditto gales, with fre-

quent heavy squalls of wind and rain to noon. No observation. Latitude  $15^{\circ} 50'$  N., longitude  $85^{\circ} 46'$  E. Noon, NE. wind; severe heavy gale, frequent squalls of wind and rain, increasing sea to midnight.

15th November.—At 2 A.M. the same. Hove to under close-reefed main top-sail, carried away flying-jib-boom and one shroud of the main rigging. Noon, strong gales. Wind at 3 A.M. NE. At 6, North. At 8, NNW. At 10, WNW. No observation. Latitude  $16^{\circ} 00'$  N., longitude  $86^{\circ} 06'$  E. P.M. strong heavy gale, WNW. and constant rain. 2 P.M. increased to a perfect hurricane, vessel lying on her broadside at 4 P.M. with wind at WSW. At 9, wind SSW. At 11, gale moderating with frequent heavy squalls. Midnight, wind SSE.

16th November.—At 4 A.M. decreasing. At 6 A.M. wind SE. Bore up. At 8, fresh breeze, &c. cloudy to noon, when fine. Latitude observation  $15^{\circ} 30'$  N., longitude  $85^{\circ} 09'$  E.

17th November.—Fine breeze SE. throughout. Latitude  $17^{\circ} 33'$  N. longitude  $86^{\circ} 05'$  E.

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Translation of an Extract from the log of the French Ship "Le Balguerie," Captain Thore. Reduced to civil time.

At Noon, 12th November.—Wind variable from W. to NW. heavy constant rain, strong squalls NW. to NNW. No observation. Latitude by account $11^{\circ} 36'$ N., longitude by account $90^{\circ} 20'$ E. Bar. 27.15 (French) or 28.95 English. To midnight squally weather, continual rain, a swell from the eastward, wind from NW. and NNW. in violent squalls.

13th November.—At midnight the wind hauled to west, and towards daylight blowing strong from the SW. with a considerable sea. No observation. Lat. by account $13^{\circ} 15'$ N., longitude 90° E. Bar. 27.82 French, or 29.66 English.

14th November.—Wind hauled to the SE. At daylight squally, with heavy rain. A heavy confused sea. No observation. Latitude by account $16^{\circ} 20'$ N., longitude $88^{\circ} 54'$ E. Bar. 27.8 French, or 29.64 English. P.M. Cloudy, squally, and much rain and sea, wind North-easterly, with strong squalls towards night.

15th November.—At daylight wind hauling to the east. No observation. Latitude by account $17^{\circ} 56'$ N., longitude $87^{\circ} 50'$ E. Bar. 27.9 French, or 29.74 English. Cloudy, squally weather; squalls from NE. to NNE. with a good deal of sea.

16th November.—At midnight weather moderating a little; lightning in the SE. quarter. At daylight squally and rain. Wind at ENE. and E. Latitude by observation $20^{\circ} 10'$ N. longitude $88^{\circ} 49'$ E. Bar. 27.12 French, or 28.90 English. Noon, fine weather, pleasant breeze from E. to ESE. At half-past nine saw the Lighthouse on False Point Palmiras, very close. *Remarks.* During the ten days from the Equator to Point Palmiras I may be said to have had constant rain.

Extract from the log of the ship "Duke of Bedford," Captain Bowen, bound to Calcutta. Reduced to civil time.

12th November, 1839.—At noon, wind SE. fine

{	Lat. observation,..	$11^{\circ} 41'$ N.
	Longitude,	$91^{\circ} 21'$ E.
	Barometer,	30.00
	Thermometer,	82°

13th November.—Wind SSE. to EbS. squalls and rain throughout. No observations.

{	Lat. per account,	$14^{\circ} 49'$ N.
	Longitude,	$90^{\circ} 22'$ E.
	Barometer,	29.90
	Thermometer,	81°

P. M.—Heavy squalls ESE. At midnight Bar. 29.80, and falling.

14th November.—Weather very threatening, and a low scud flying rapidly over. Furl'd the topsails and up foresail. During the forenoon blowing very hard. Barometer stationary. At 9 A. M. set close-reefed main-topsail, fore-sail, and main-trysail. Got a glimpse of the sun at noon; found ourselves at least sixty miles to the northward of our account since noon of the 12th,

{	Latitude,	$17^{\circ} 35'$ N.
	Longitude,	$90^{\circ} 20'$ E.
	Barometer,	29.80
	Thermometer,	80°

A little after noon, blowing in heavy gusts. 4 P. M. Bar. 29.70. Down top-gallant-yards and struck masts.

15th November.—Up fore-sail and furl'd it. Torrents of rain throughout, with vivid lightning. No observation.

{	Lat. per account,	18° 27' N.
	Longitude,	89° 35' E.
	Barometer,	29.80
	Thermometer,	80°

Blowing hard at east, and heavy rain. At 11 p. m. a sudden lull and calm, with vivid lightning SSE. Clued up the main-top-sail. At 11h. 20m. p. m. again freshening at east. During the 14th and 15th a great number of land birds and dragon flies about the ship; some of the former were caught.

16th November.—Weather continued till noon. No observation.

{	Lat. per account,	18° 20' N.
	Longitude,	89° 05' E.
	Barometer,	29.90
	Thermometer,	80°

p. m.—Thick weather. At present clearing off. Made sail.

17th November.—A light breeze throughout, easterly. At a.m. sounded, 60 fathoms, blue mud. And at noon,

{	Lat. observation,	20° 42' N.
	Longitude,	89° 45' E.
	Barometer,	30.05

We have experienced a current of at least sixty miles to the northward since noon of the 14th.

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*Ship "Cashmere Merchant," Capt. Warren, from Calcutta bound to Rangoon. Civil time.*

12th November.—At noon in lat. 16° 58' N., long. 92° 25' E. with light breezes and clear weather, increasing at midnight to strong and increasing breeze from ENE. and NEbE. to ESE.

13th November.—Increasing, but wind as before. Preparing for bad weather. Noon, no observation. Wind east, and varying to ENE. at times. Midnight strong gales.

14th November.—Gale increasing ESE. throughout. No observation.

15th November.—Strong gales ESE. heavy squalls and rain with a heavy sea. Noon, latitude by observation 17° 33' N. Weather the same, till midnight. p.m. Wind SE.

16th November.—ESE. fresh breezes and clear. Noon, latitude by observation 17° 29' N., longitude 92° 25' E. Weather the same till midnight.



17th November.—The same. ESE. to SE. breezes, and fine. Noon, lat.  $16^{\circ} 37'$  N. longitude  $92^{\circ} 7'$  E.

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*Abstract of the log of the ship "Rosalind," Captain J. Fenrose.
Reduced to civil time.*

13th November, 1839.—Strong gales NE. and squally, with heavy showers. Noon, no observation. P.M. Wind NNE. every appearance of an approaching gale. 4 P. M. Thick, cloudy, and very dark from the eastward. Wind the same, hard squalls and rain, prepared for bad weather. Hove to under close-reefed main topsail and reefed try-sail, very heavy cross sea. Wind and weather the same at midnight.

14th November.—A. M. Weather as before. Daylight, hard gales NNE. with heavy squalls of hail and rain. Noon, no observation. P. M. and till midnight, wind North to NbW. At 10 P. M. hard gales and stormy weather, with tremendous cross sea; lying to as before.

15th November.—A. M. The same weather, with much lightning. Wind veered to WbN. at 2 A. M.; to WbS. at 6 A. M.; and to SW. at 10 A. M., at which time it was blowing a hurricane. Sprung the main-mast-head. At noon, wind SW., shipped a heavy sea, which stove in the door and windows of the round house. Wind veering round the compass to SSW. at 1 P. M. No observation. The wind SSW. confused sea, strong breeze (gale?) and squally during the afternoon. At 6 P. M. wind SbW. Midnight, squally and rain.

16th November.—4 A.M. More moderate, and less sea at 9 A. M.; made sail at noon. Latitude by observation, $16^{\circ} 15'$ N.

I was, unfortunately, not able to obtain a single longitude with this otherwise valuable log; so that I have been obliged to place the ship, by guess, on the track of the hurricane. Judging from the time of the varying of the wind, she must have been not far from the Ripley, and I have been guided by that vessel's very careful log, in placing the Rosalind. Captain Fenrose concludes his communication with the following remarks—"I have been at sea 41 years, and have remarked that previous to high winds the wind is variable. But previous to a hurricane, the sky is very clear. You can see objects at a very great distance, the sea very smooth, and at night the stars are very numerous, more than at other times; and at times during the day small clouds are seen at an immense height, such as sailors call, 'Mackerel Sky,' and their appearance changes very fast, some parts having the colour of the rainbow. If in north latitude,

the wind backs round contrary to the sun, it will increase ; if in south latitude the reverse.

"In the first hurricane which I experienced, in the Gulf of Mexico, the clouds of scud appeared to touch the masts ; this was on the 18th and 21st August, 1827."

Extract from the log of the Brig "Ripley," Yorke Steward, Commander. Reduced to civil time.

Thursday, 14th November, 1839.—On the 13th, at noon, latitude $15^{\circ} 22' N.$, longitude $85^{\circ} 05' E.$ steering East and EbN. Strong monsoon with hard squalls and heavy rain. In the middle and latter parts of these 24 hours, wind steady at north, but gradually increasing and the mercury falling. At noon it was 29.65. Ther. 75° ; then blowing a heavy gale ; ship under close-reefed main-topsail. Noon, latitude by dead reckoning $14^{\circ} 30' N.$, longitude $85^{\circ} 21' E.$ Ship's head to N.E. Wind veering to NNW. and NW. Barometer at midnight 29.50.

15th November.—At 8 A.M. Bar. 20.30, but not at all steady. Noon, it was 29.25. Ther. 73° . Throughout these 24 hours a heavy gale, with incessant heavy rain, and severe gusts of wind ; the sea comparatively smooth, ship lying to under storm trysail. The last 12 hours the wind appears to have been blowing at its greatest fury. Noon, latitude by account $13^{\circ} 55' N.$, longitude, $85^{\circ} 58' E.$ Wind WNW. At 4 P.M. West. Mercury fluctuating from 29.30. to 29.40. 6 P.M. Wind WSW. moderating a little. Bar. rising. Midnight, wind SW.

16th November.—6 A.M. SSW ; at 9 A.M. SbE., and at noon SEbS ; At 10 P.M. it ceased raining. Strong breeze and fine clear weather ; towards noon moderating to a fresh breeze and clear weather, latitude $15^{\circ} 33' N.$, longitude $86^{\circ} 57' E.$ Bar. 29.75. Ther. 80° . The following day the wind remained steady at SE. and settled fine weather.

Extract from the log of the Barque "Sumatra," Capt. Langlois, from Padang towards Calcutta. Reduced to civil time.

At noon 12th November, 1839.—Latitude obs. $15^{\circ} 29' N.$, longitude $91^{\circ} 02' E.$ To midnight fresh breeze, ENE.

13th November.—To 6 A.M., fresh breeze, ENE. ; 6 to 10 EbN. ; to noon ENE. Midnight strong breeze, squally and rain. Noon, fresh gale. Latitude by observation $17^{\circ} 41' N.$, longitude $90^{\circ} 42' E.$ Wind ESE. Wind ENE. to 4 P. M. veering to East at midnight.

14th November.—Wind NEbE. to 8 A. M. ; ENE. to noon ; increasing breeze with small rain. Towards noon, squally appearance in the south-eastward, with a swell. Latitude account $19^{\circ} 08' N.$, longitude $89^{\circ} 49' E.$ Wind ENE. to 2 P. M. ; then East, and EbN. $\frac{1}{2} N.$ at midnight.

15th November.—Wind ENE. at 8 and till noon. P.M. Increasing gale and dark rainy weather, with a heavy sea. At sunset, hove to ; heavy gale, with constant rain, hard squalls occasionally to noon. Latitude account $18^{\circ} 57' N.$, longitude $89^{\circ} 34' E.$ Hove to, till midnight.

16th November.—Hove to these 24 hours. Wind ENE. to E. ; heavy gales with a high sea, cloudy, dark weather, and increase of rain. Sunset, heavy squalls, and rain at intervals. Lightning to the southward. Daylight, less wind. Weather clearing up in the SW. Latitude account $18^{\circ} 40' N.$, longitude $89^{\circ} 12' E.$ Wind ESE. to 8 P. M. and SEbE. to midnight.

17th November.—Wind SEbE. to 8 A. M. and ESE. and EbS. to noon. Weather moderating throughout. Latitude $20^{\circ} 30' N.$, long. $89^{\circ} 30' E.$ P.M. fine weather.

Report of Captain Campbell, Assistant Surveyor General, Baramahl Survey, to the Secretary to Government, General Department.

I have the honour to report to you, that the Barometers in the office of the Salem and Baramahl Survey, at present in quarters at this station, have marked the progress of the hurricane which appears to have visited Coringa on the 16th November. The Barometers are two, on the Syphon plan, and have been filled wet. By continued comparison it has been found that the greatest difference between the two is about .04 of an inch, and the least .02 inch, which difference appears to be less than the error between Mr. James Prinsep's standard Barometers. The instruments may therefore be relied on. From the observations, it appears, that the Barometer commenced falling here on the 6th November, and continued to do so regularly till the greatest depression was attained on the 20th, at 4 P.M. of the afternoon observation, and at 10 A.M. of the 21st November of the morning observation ; from that time, it regularly rose until the 26th November, when it indicated the same pressure as on the 6th. The greatest difference between the pressure on the

6th and the minimum was 0.16, of an inch ; the morning and afternoon observations giving the same results. The weather has been settled since the 7th November. Before the 7th the wind was settled to about NE., and variable, afterwards veering about from N. at W. but in no regular manner ; since the 26th it has settled at NE. and East again. I believe an abstract of the observations of pressure would be of no use, as from the great height of this place, 3,250 feet above the sea, they would not be comparable with any other set. I do not therefore forward them.

Royacotta, 4th December, 1839.

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*Report of G. A. Smith, Esq. Collector of Coringa, to the Secretary to Government, General Department.*

SIR,—I have the honour to submit the annexed statement of remarks made by myself at the time at Samulcottah, about eight miles inland ; those made by the Superintendent of the Lighthouse on Hope Island, off Coringa, and the extracts from the logs of the “ Jane ” and “ Indian Queen,” relative to the storm which visited the Rajamundry district, on the night of the 16th ultimo. It has been observed to me, that though the inundation of the sea was attributable to the East wind, and had that continued a short time longer the consequences would have been still more disastrous, yet that the wind was actually stronger, and more damage was done to houses, &c. after it shifted to the SE. This is also borne out by my own observations, since made, on the manner in which property has been damaged in different places ; but still both remarks may be correct with reference to the positions in which they were made, particularly as the latter part of the storm came principally in gusts. The oldest inhabitants remember a storm of a like nature, and equally disastrous in its consequences, which visited this district in the year 1787, since that time, there have been storms and inundations at intervals, the last having been on the 10th May 1832, but nothing in comparison with the present.

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Observations of George A. Smith, Esq. Collector of the District of Rajamundry, on the storm of 16th November 1839.

On the night of the 16th instant, this district was visited by a most awful storm, attended by an inundation of the sea, which has

destroyed many villages on the Coast, and caused a very heavy loss of life, I fear, at least, to an extent of five thousand; including those from the number of vessels wrecked. According to my own observation, the storm commenced about 10 P.M. of the 16th from the North-East, it afterwards veered round to the Eastward, from which point it blew strongest, and after lasting six hours, ceased about 4 A. M. of the 17th, the wind having got round to the Southward. I had not the means of referring to a Barometer, but I have understood that the fall was about an inch.

Observations of Mr. W. L. Pascal, Superintendent of the Lighthouse on Hope Island off Coringa, on the Hurricane of 16th November 1839.

On the 16th November. 1839. Saturday, at about 8 A. M. it commenced blowing fresh from the North-Eastward, with mizzling rain, and continued so till 1 P. M., when the wind shifted round to the NNW. and terminated into a gale. About 2 P. M. the wind shifted to NW. when the river commenced rising, and at 8, the Island was under water. At 10, the wind hauled round to the NE. and blew a dreadful hurricane, (during which time the water rose to about 2 feet in the Lighthouse, with a heavy confused sea beating against it, which burst open the door, and swept away every article in it; at this time the top of the Lantern wrenched and whirled itself aloft. The conductor broke into five pieces, and my house was completely washed away, with every article it contained. At 12 A. M. the wind shifted to the Eastward, and at 1 A. M. 17th, Sunday, it shifted to the South-Eastward, and blew tremendous strong; at 2 the water began to recede; at day-break the weather cleared up, and we found five corpses on the Island.

Extract from the log book of Schooner "Jane," furnished by Capt. Hazlewood.

14th November.—1839. The Schooner "Jane" at sea, in longitude $89^{\circ} 20'$ * and latitude $17^{\circ} 10' N.$ At 10 P. M. the gale commenced from the Eastward, and continued from that quarter till the 16th, and then the wind changed to the SE. and cleared up. During the gale, we

* This must be I think an error of the copyist's, for $89^{\circ} 20'$ would require a drift of 250 miles to have made the last as subsequently mentioned. I suppose $87^{\circ} 20'$ to have been the vessel's position.—H. P.

were drifted away to the Northward three degrees. On the 17th, made the land about Ganjam. On the 19th, passed Vizagapatam, and were boarded by a catamaran, which informed me that four native vessels had been wrecked at that place, and the "Indian Queen" put to sea, leaving her Commander on shore. On the 20th, when steering for Juggernathpooram roads, saw the coast strewn with wrecks of native vessels, and passed 15 bodies of both men and women, and lots of buffaloes. On the 21st came to an anchor in Juggernathpooram roads, and found the "Indian Queen" at an anchor, with the loss of her foremast and bowsprit.

THE LATE HURRICANE.

Extract of a letter from Coringa, Nov. 24, 1839.—"Indian Queen" outside.

I have got the little finger of my right hand broken, so you must not expect a long letter, as I can hardly hold the pen. I put to sea last Saturday morning at 1 o'clock, as the weather looked very threatening (in Vizagapatam roads) and at 9 o'clock a gale of wind came on. At midnight we had our jolly boat washed away, pitched away the bowsprit, the foremast followed it, and main and mizen top masts. Both pumps choked, and the ship making water. When the boat went, it knocked in one of the stern ports, and filled the cabins. All hands baling ship and cabins with buckets; and had one sea come over us, we must have gone down. I assure you we have had a complete hurricane, and it is God's mercy we ever were saved; I never expected it. When the gale abated, we were in 25 fms. muddy water, and had it lasted another three hours, we should have been snug on shore. Thank God we are safe. Did you but see the horrible ravages the gale has committed at Coringa, you would be surprised; in fact it baffles all description. Every vessel in the river, and miles up, are on shore and in the jungle, and all the vessels outside, with the exception of seven, are all wrecked. Wrecks are lying about in all directions: innumerable dead bodies of men, women, and bullocks. Coringa is nearly washed away, Lighthouse, Flag-staff, and all. Captain Pendygrass of the "*Catherine*," and Captain Marshall of the "*Charles Dumergue*," both drowned, with their mates and apprentices. They were all on board the *Dumergue* at the time she broke adrift—went up the country, sprung a leak and went down; and I suspect

these gentlemen must have jumped overboard, and never reached the shore, as the vessel has since been got up, but no bodies in her. She has sustained a dreadful loss. Oh ! it has been an awful gale. I can't help feeling thankful for our safety, when I witness the horrible devastation of property and loss of life at this place. I hope you have not suffered so at Madras. I will give you a full account in my next. Captain Shreeve, I am sure, has put us down for lost, long ago. I consider our safety a most miraculous escape. We left four vessels in Vizagapatam roads ; all went on shore, were dashed to pieces, and every soul perished. Fancy *all that gale can do*—and then you will not guess half. Every person is starving here ; nothing to be got for love or money ; I would rather have been where I was, out at sea, than in the finest dock at Coringa. Every vessel has suffered, but poor Marshall and Pendency have been the worst ; and their vessels too at a place where you would think no gale that ever blew could hurt them.—*Madras United Service Gazette, Dec. 4.*

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AN AWFUL HURRICANE.

Four days tappal (the 11th to the 14th inst.) arrived simultaneously from Calcutta on Monday morning. The cause of their detention is found in the subjoined accounts of an awful hurricane experienced to the northward. It is most providential that at Samulcottah, where it appears to have raged with so much violence, not a life has been lost ; but we fear that from seaward and the immediate line of coast where the agitated sea made irruptions, bad accounts will be received. The devotion of the faithful sepoy guard over the treasure, when the warring elements seemed to dictate a quest of the nearest shelter, will elicit warm approval.

*Samulcottah, 18th November.*—The small station with its neat thatched cottages and well kept parade, is now a scene of desolation. It was visited on Saturday night by one of the most severe hurricanes ever known in this part of the country : it blew from 6 o'clock in the evening till 5 o'clock the next morning, carrying away the roofs of all the thatched houses, and leaving their inmates wet and shivering in the dread of the walls falling in upon them. Happily this was not the case ; but, with the exception of the Collector and Commandant, every officer is houseless, and even theirs' have been much shattered, though tiled. The sepoys' huts have been totally blown to pieces, and their

families have taken refuge in the verandahs of the barracks. One fact alone will illustrate the want of shelter now at the station :—two native officers with their families are occupying the solitary cells *at their own request*. Trees that have stood for eighty years are now blown down, even to the tamarind tree, which has generally such a firm grip of the earth. A magnificent specimen of one in front of the Collector's Cutchary is fallen. The whole country is under water, and the communication cut off from Cocanada and Ingeram, and we fear accounts from that quarter will bring us lamentable details of the loss of life and shipping.

A hurricane similar to this occurred here in 1832, but not so violent, or of so long a continuance.

Treasure to the amount of Co's. Rs. 1,50,000 was left unguarded on the plain ! but it was only for a short time, as the sentries who had been blown away, managed to crawl back and throw themselves on the bags ! A fine trait of devotion truly !

(*Another account*) Nov. 18.

'It may be interesting to you to hear some accounts of the late most awful hurricane we experienced here—from about 8 o'clock of the evening of the 16th, till 4 the following morning—when the raging elements began to subside ; and when it became day-light, we were enabled to see the havoc that had been committed. And indeed to behold the scene it was heart-rending : all the thatched houses in the place unroofed—trees laid with the ground, and even some that must have stood all weathers for the last half a century. The Lines were quite destroyed—*not* one house from right to left that has not been blown down ; and as for the officers' houses, with the exception of the Major's, not one dry corner could be found ; and the scenes that were resorted to, to try and save themselves from the wind and rain, each man the next morning recounting his adventures, certainly made us smile in spite of the awfulness of the scene. Some got under tables, others under beds, some sat on chairs moving from one spot to another that could afford them shelter for the time, some were obliged to quit their houses and take refuge in the mess house, being a tiled building. You can hardly fancy the wreck that the place is in ; but just recall to your mind the scene that the Mount Road presented after the gale in 1836, and you *may* have some idea of how this place now looks—not *one whole* tree standing in the place—if not blown

down, all the large branches torn off, and only the trunk remaining—indeed we ought to be most thankful that no lives have been lost here. The accounts from Rajamundry are just as bad as this; and from Cocanada the reports are dreadful—that the sea has quite washed away the lower part of that village—from Coringa, and Nirapilly, nothing has been heard, but there is much alarm about their safety. We had a good deal of rain yesterday, and a good deal last night—which brought the Samulcottah river almost up to the only part of the old wall of the Fort now standing on the East side. The gale commenced about NE. came round by degrees to the East and got about SE. when it began to abate. The quantity of rain that fell is not known, as the Pluviometer was running over, and there is no knowing for what length of time. The Barometer fell about 1 inch from 12 o'clock on the 16th, till 12 o'clock of the 17th instant.

‘To-day there has not been much rain.’—*Spectator*, November 27th.

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(Another account.)

The subjoined particulars of an awful calamity with which Coringa and its neighbourhood have been recently visited, have just reached us. We lay them with a heavy heart before our readers, making no comment upon them, but leaving the sad tale of woe which they relate to speak for itself.

‘We were visited on the night of the 16th instant by the most terrible gale of wind possible. Your house at Ingeram is completely unroofed, the trees and walls of the compound destroyed, and P*** was very nearly drowned. All the European and native houses are uninhabitable, and there is nothing to be seen from Coringa to this, but a heap of ruins.

The wind began to blow in the afternoon of the 16th, but was moderate till about 11 o'clock at night, when it became furious, and lasted till 4 o'clock the next morning.

The water from the sea rushed in with such violence, that the only houses remaining at Coringa, are ***'s large house, and three or four other brick built houses. All the rest, it is said, have been carried away. I have had $2\frac{1}{2}$ feet of sea water in my garden, and in my room which is under my bungalow, $1\frac{1}{2}$ foot.

It is said that more than 20,000 people have perished by this terrible hurricane, which lasted only five or six hours. There is nothing

to be seen in every direction but dead bodies and drowned cattle. *Sixty* native vessels which were in the roads, laden with paddy, have disappeared, and it is not known what has become of them. The "*Union*," although she had *four* anchors and chains out, was carried away, and is now laying at a short distance from the middle of the river of *Nellapilly*. The "*Catherine*," which was in a mud dock, and well secured by the earth, was also carried away, but fortunately got into the "*Charles Dumergue's*" dock, which the last named vessel had left a few days before. The "*Charles Dumergue*" was drifted into the large river of Yanam, and is now half buried in a sand island, opposite where the ferry boat crosses over; but no news at all of her captain who was on board, and also of the commander of the "*Catherine*," his brother-in-law, and a few other people. They might have been all drowned, as all over the country was nothing but like the sea. You can have an idea of it when I tell you, that I see from my house a Choolia sloop lying quite near the white pagoda of *Onagalo*, which is four or five miles from *Coringa* in the interior of the land!—*Madras Herald*, 27th Nov.

VIZAGAPATAM.—The first five days fresh NE. monsoon,—the two last days a heavy gale, as hereafter described.

'The appearance of the weather on Friday evening, the 15th, betokened a gale, which commenced increasing during the night, when it blew hard on Saturday morning the 16th, with heavy squalls of rain from NE. to North, which continued, mostly from the North during the day.—The barque '*Indian Queen*' put to sea in the course of the night on Friday; and in the strength of the gale on Saturday, about 11 A. M., four Native craft (lately from Arrakan with grain on board) put to sea. Two others in a most unaccountable manner having cut their cables and made sail came on shore against the Northerly (off shore) gale!—The gale veered back to the Eastward, and blew hard during Saturday night from ENE. to East without much rain; and on Sunday morning it moderated a little, shifting to the SE. when it became more moderate, with occasional showers, and veering to South still more so, but continued to blow a fresh breeze from that quarter during the night. Monday morning the gale had subsided, and the wind was light and variable, with squalls of rain from W. to NW.—Noon, light variable winds from the Westward with unsettled and cloudy weather. It is said that nine hands are missing

from the crews of the two vessels wrecked here, and apprehensions are entertained for the safety of the Native craft that put to sea: two men were saved by the six tide-waiters and their catamarans off the Port.'—*Madras Herald*, 27th Nov.

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*Report to Government, by Charles Hawkins, Esq. Master Attendant,  
 Vizagapatam.*

For several days previous to the 16th and 17th November, it had blown a fresh North-east Monsoon wind, and two days previous, the sky had assumed a reddish, brassy, and cloudy appearance; particularly so, on the evening of the 15th, it still blowing fresh from the north-east, which increased steadily from the same quarter, during the night, to a decided gale, which blew hard on the morning of the 16th, when it veered to the northward and blew hard the whole day, varying from NE. to north, (mostly north) with occasional heavy gusts of wind and rain, the strength of the gale blowing about 10 o'clock A. M. In the evening the wind veered back to the eastward, and blew hard, and steadily during the night from ENE. to East, without much rain. On the 17th, morning, it moderated a little, and shifted to the south-east, and veering to south, it became still more moderate with occasional showers of rain during the day. It blew a fresh breeze from the southward during most part of the night of the 17th, and on the morning of the 18th the gale had subsided; wind light and variable, with squalls of rain from West to NW. Noon, light variable airs from the westward, with cloudy unsettled weather.

N. B.—This gale was not felt at the Military Cantonment of Vizianagram, distant N. by E. thirty miles, nor was it felt at a Military post forty miles west, where they had but a few squalls of rain with the monsoon strength of wind. From reports from the adjoining southerly district of Rajamundry, those parts must have experienced much heavier weather than has occurred in this district. I have seen it blow much harder here, during twenty-three years service at this port, but I have never seen a heavier sea; the surf breaking in nine fathoms water.

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*Extract from the log of the Barque "Indian Queen," in Vizagapatam
 Roads. Civil time.*

15th November, 1839.—Strong breezes and cloudy weather, but discharging cargo.

16th November.—At 1h. 30m. A.M. of this date, the weather assumed a very threatening appearance. Slipped both cables, and stood to sea under a press of sail, to obtain an offing; wind from N. to NNE. and at 9 A. M. NE. strong gales, drizzling rain, and a high sea. Gale increasing at noon, hove to under main trysail, and made every preparation for bad weather.* At 6 P. M. wind ENE. Gale increasing, with a heavy sea. At 7 A. M. jolly-boat washed from the stern and knocked in one of the stern ports, which admitted a great deal of water, both pumps choked, and all hands baling. Midnight, heavy gales, with violent blasts of wind every minute, and a high sea, all the sails blown away from the yards, though lashed to them. Wind veering from ENE. at 6 P. M. to SE. by midnight.

17th November.—At 1 P. M. the gale increased to a complete hurricane at SE.; pitched away bowsprit, foremast, main and mizen topmasts; put before the wind, which was at ESE. to save the rudder, and clear away the wreck, and hove to again. At 2h. 30m. A.M. trysail and gaff blew away. Wind at ENE. for one hour (1 to 2), but SSE. by half-past three, and South at 6 A. M. Heavy seas striking the vessel, which kept all hands baling. At daylight the weather, as before with a heavy cross sea running. At 6 gale abating, ship rolling gunnels under; made a little sail, wind at SW. by $7\frac{1}{2}$ A. M. when sounded in 25 fathoms, and saw Juggernautporam, bearing West. Noon, strong breezes SW. with a heavy swell. No observation. P.M. Wind South; came to in $7\frac{1}{2}$ fathoms. On the 18th fine weather.

Abstract of the log of H. C. Steamer "Ganges," Capt. Dicey, from Calcutta to Moulmein, under sail. Civil time.

12th November 1839.—From midnight to 4 A.M. moderate breezes and hazy weather, wind EbN. At 8 increasing with a confused sea on. Noon, fresh breeze EbN. Latitude observed $18^{\circ} 09' N.$, long. $88^{\circ} 33' E.$ P. M. Strong increasing breezes, and dark gloomy weather with increasing sea; wind ENE. At 4 P.M. dark and threatening till midnight.

13th November.—Wind EbN. till 10 A.M. Squally and dark gloomy

* Captain Shreeve informs me that at this time he considers Vizagapatam to have been bearing NW. 70 miles from him. The gale did not extend as far North as Ganjam, nor South to Masulipatam.

weather, appearance of a gale. Hard and increasing gale; made all snug, vessel labouring much. 10 A.M. wind ENE. till noon, when hard ENE. gale with very high sea. No observation. Latitude by account $16^{\circ} 21'$ N. longitude account $88^{\circ} 51'$ E. P.M. Hard gales ENE. dark gloomy weather. 6 P.M. Barometer 29.00. At 8 *weather apparently moderating*. Midnight, strong gales with a high sea. Bar. 29.0.

14th November.—Strong gale at ENE. dark gloomy weather, with a very high sea striking the paddle box, cabins, and sponsons with tremendous violence. At 4 A.M. the same, with heavy rain. At 6 wind east, high sea running. At 7 wind ESE. At 8 put on steam, full power, but could not obtain steerage way, wind EbS. Noon, fresh breezes, with very heavy sea running, drizzling rain, ship labouring much. No observation. Lat. account $15^{\circ} 37'$ N. long. account $88^{\circ} 38'$ E. Barometer 29.20. 1 P.M. wind SE $\frac{1}{2}$ S. Weather apparently clearing, made some sail. 7 P.M. squally with rain. 8, strong increasing gales and dark cloudy weather. Midnight the same.

15th November.—SE. wind, hard gales, lightning to the northward, and SE. occasionally. Daylight, strong gales and dark gloomy weather. At 8 A.M. decreasing gale and cloudy, but a high sea on. Noon, more moderate. Latitude by observation $16^{\circ} 17'$, longitude by Chron. $89^{\circ} 40'$ E. Barometer 29.20. 1 P. M. wind SE. as before, decreasing breezes and cloudy. 4, fresh breezes with dark gloomy weather, passing squalls, rain, and a heavy sea. At 8, the same. At midnight stiff breeze, with alternately clear and cloudy weather. Barometer 29.30.

16th November.—Wind SE. fresh breezes and cloudy. At 2 A.M. light breezes. 5 A.M. Wind SEbE. At daylight fresh gales. At 8, Barometer 29.50. Decreasing strong breeze, with a high sea. At 10, weather clearing up. At noon, moderate and clear. Lat. by observation $18^{\circ} 16'$ N. longitude $90^{\circ} 55'$ E. At P.M. wind EbS. moderate and fine till midnight.

Captain Dicey remarks, that “before the gale came on with him, the weather appeared threatening, with a cloudy and gloomy sky, the Barometer fell very suddenly to 29°, and during the breeze the wind was from SSE. to the NE. *After the first blow, it broke a little*, and I put on the steam, and managed to make a little easting, and although it came on again, it was with less violence, ; after which I found as I progressed to the eastward, the gale became less violent,

and had a very heavy confused sea, with hard gusts of wind at intervals, and I think we experienced this storm with less violence than other vessels further to the westward."

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*Capt. West, H. C. Steamer "Enterprise," informs me as follows.—*

We had no bad weather, to speak of, across the Bay from Akyab; but whilst there, on the 13th, 14th, and 15th, of last month, the weather was rather threatening from the eastward. The "Amherst" left Akyab on the 15th, and I understand they had a fresh breeze across from ESE. We left Akyab on the 16th, and experienced a heavy swell from SW. to SSW. and as we got over to the westward it was rather squally, but not of the least consequence. The swell continued till we got well up the Eastern Channel, but we had no wind. We arrived at Calcutta on the 18th November.

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Extract from the log of the "Helen," Captain Henderson.

13th November, 1839.—Moderate breezes from NE. to ENE. throughout the 24 hours, all sail set by the wind. Latitude at noon 19° 00' N., longitude 88° 30' E.

14th November.—The first 12 hours squally, with rain from NE. and eastward. Latter part steady breezes from the ENE. Latitude noon 20° 10' N., longitude 88° 35' E.

15th November.—Moderate breezes from the eastward, with cloudy weather. At daylight passed close under the Floating Light Vessel's stern and hailed her, but could not get a pilot (none being on board her). At 4 P.M. were advised by one of the Pilot brigs to stand to sea, the weather having a very threatening appearance, and the wind increasing fast. At 6 P.M. put the ship under double reefed topsails and foresail, down royal yards, &c. Fresh gales, with strong squalls. Sun obscured.

16th November.—Ditto weather with rain. At 6 A.M. wore ship and stood to the NNE. wind East. At 4 P.M. sighted a Pilot brig, which signalized to us to stand to sea; fresh gales with heavy squalls. The Pilot brig off the Eastern Sea-Reef was at anchor on the tail.

17th November.—The first part of these 24 hours, fresh gales with hard squalls. Latter part, moderate winds from SEbE. and clear weather, latitude 20° 22' N., longitude 87° 25' E.

Extract from the log of the H. C. S. "Amherst," 13th to 17th November, 1839.

13th November.—At anchor in Akyab harbour. At midnight, wind moderate at north, and threatening appearance.

14th November.—Wind N., NNE., NNW., NW., NE., and at midnight North; moderate, and light threatening appearance at daylight. At noon clearing, but dark to the westward. Bar. at noon 29.90. At midnight, moderate, but inclined to be squally and a threatening appearance.

15th November.—North to NNW. and NE. At noon, moderate
 8 A.M. Bar. 29.94 and light air, but threatening appearance. Noon,
 Noon 93 looking better; weighed, and crossed the bar.
 4 P.M. 80 Bar. fell to 29.80; heavy swell from South; at
 8 — 84 8, moderate Northerly wind, and cloudy. Mid-
 Midnight 86 night fresh breezes, and cloudy, heavy swell
 from SSW.

16th November.—To daylight wind North to NNE. fresh breezes,
 4 A.M. Bar. 29.86 cloudy, and squally; threatening appearance to
 8 — 89 the W. Daylight, strong breeze and rain, and
 Noon 91 wind NE.; very threatening appearance to ESE.
 4 — 86 Noon, wind east, moderate; lumbering swell
 8 — 90 from ESE. and a cross swell all ways. Lat. D.R.
 Midnight 88 20° 48' N., lon. Chr. 90° 13' E. P.M., Wind east,
 threatening to SE. and swell from SSE. but in-
 clined to clear. 8 P.M. Lat. by (21° 12' N., at
 9 P.M. 12 fathoms water. Midnight moderate and
 cloudy, threatening to Southwest-ward. 11 fa-
 thoms water.

17th November.—Moderate but squally, threatening to SE. and SW.
 4 A.M. Bar. 29.82 sea moderate, wind east. 1 A.M. Floating Light's
 8 — 86 signal WbN. $\frac{1}{2}$ N.
 Noon 90

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*Extract of a letter from Dr. Cumberland, Civil Station, Pooree.*

The gale which prevailed on the Madras Coast in the middle of November, did not extend to Pooree. On the 10th November we had light winds from the north, and in the afternoon SE. with cloudy



weather. On the 11th, moderate breezes from NE. and cloudy weather. 12th, NE. to E. cloudy. 13th, NE. fine weather and fresh breeze. 14th, NE. Moderate breeze, and fine weather. 15th, NE. to ENE. strong breeze, cloudy with rain (nine-tenths of an inch,). 16th, NE to ENE. strong breeze. At 5 P.M. squall from ESE. and a little rain (one-tenth). 17th, ESE. rather cloudy. At 4 P.M. SSE. then E. to NE. At 5 P.M. ESE. light winds.

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Captain Elson, Master Attendant at Chittagong, in forwarding the following register kept by Lieut. Young, Indian Navy, H. C. Surveying Brig "Hatrass" says.—

We had no gale here, (at Chittagong) but about the 14th, 15th, and 16th November, we had very cloudy weather, with slight rain, the wind variable from NNE. to SE. but nothing approaching to a gale, although there was a heavy sea outside.

Date.	Hour.	Place at Noon.	Barometer.	Thermometers.			Winds.	Remarks. November, 1839.
				Att.	Det.	W. Bulb.		
13th	6	.....	29.98	76 $\frac{1}{2}$	78	76 $\frac{1}{2}$	North.....	Moderate breeze and cloudy weather.
	10	.....	30.01	76 $\frac{1}{4}$	78	76 $\frac{1}{2}$	NE.....	Moderate breeze and cloudy weather.
	12	Lat. 21.26 Long. 90.47	29.97	76 $\frac{1}{2}$	78 $\frac{1}{2}$	76 $\frac{1}{2}$	NE.....	Moderate breeze and cloudy.
	4	.....	29.92	76 $\frac{1}{2}$	78 $\frac{1}{2}$	77	North.....	Light breeze and cloudy.
14th	8	.....	29.95	78	80	78	North.....	Light breeze and cloudy.
	6	.....	29.95	..	..	..	NE.....	Moderate breeze and cloudy weather.
	10	.....	29.96	78	80	78	NbE.....	Mdt. breeze cloudy with heavy swell from Southward.
	12	Lat. 21.20 Long. 90.56	29.93	78 $\frac{1}{2}$	80 $\frac{1}{2}$	78	NbE.....	Moderate breeze and cloudy.
Midnight,	4	.....	29.88	78 $\frac{1}{2}$	80	78	NbE.....	Light breeze and cloudy—Do. swell.
	6	.....	29.88	..	..	..	ESE.....	Fresh breeze and dark cloudy weather.
	8	.....	29.89	78	80	76	East.....	Fresh breeze Do. weather—heavy swell.
	Midnight,	.....	.....	.....	.....	.....	ESE.....	Strong breeze at intervals with rain—Do. swell.
15th	6	.....	29.90	76 $\frac{1}{2}$	78	76 $\frac{1}{2}$	ENE.....	[from Southward. Fresh breeze and cloudy to S. Westward—heavy swell
	10	.....	29.90	76	78	74	NE.....	Fresh breeze and cloudy—rain at intervals.
	12	Lat. 21.20 Long. 90.56	29.90	76	78	74 $\frac{1}{2}$	NE.....	More moderate without rain—heavy swell.
	4	.....	29.87	..	..	..	East.....	Light breeze and cloudy.
Midnight,	6	.....	29.86	76	78	76	N. Easterly.	Light breeze and cloudy.
	8	.....	29.86	..	..	..	N. Easterly.	Moderate and cloudy with rain,—Do. swell.
	Midnight,	.....	.....	.....	.....	.....	N. Easterly.	Light airs—heavy swell,—Do. rain.

Honorable Company's Surveying Brig "Hatrass."—(Continued.)

Date.	Hour.	Place at Noon.	Barometer.	Thermometers.			Wind.	Remarks. November, 1839.
				Att.	Det.	W. Bulb.		
16th	6	.....	29.89	76½	78½	76½	NE.	Mdt. breeze, heavy SSE. Incrd. swell—constant rain.
	10	.....	29.93	..	..	..	NE.	Light breeze and cloudy.
	12	Lat. 21.20 Long. 90.56	29.93	76½	78½	76½	NE.	Light breeze and cloudy—Do. rain Do. swell.
	4	.....	29.85	76½	78½	76½	NE.	Moderate breeze and cloudy.
	8	.....	29.90	..	..	..	NE.	Light breeze and cloudy—Do. swell.
17th	6	.....	29.94	..	..	..	NEbN.	Light breeze and cloudy ; heavy swell.
	10	.....	29.97	78½	80½	78	NEbN.	Light airs—fine weather,—Do. swell.
	12	Lat. 21.20 Long. 90.56	29.92	79	81	79	NE.	Light airs and fine—Do. swell.
	4	.....	29.88	80	82	80	SE.	Light airs and fine,—Do. swell.
	6	.....	29.88	80	82	80	ESE.	Light airs and calms,—Do. swell.
	8	.....	29.92	..	..	..	ESE.	Light airs and fine,—Do. swell.
18th	6	.....	29.93	78½	80½	78½	NE.	Light airs, fine clear weather.
	10	.....	29.97	80	82	80	ENE.	Light breeze and fine weather.
	12	Lat. 21.28 Long.	29.93	80	82	80	ENE.	Light breeze, fine weather; swell from South.
	4	.....	29.87	80	82	80	Variable. ..	Light airs and calms.
	8	.....	29.94	80	82	80	SSE.	Light airs; clear weather; heavy.
	Midnight.	.....	.....	.....	.....	.....	SSE.	Dew—Swell subsiding.

At Balasore on the 13th November, Captain Bond's report to Government, says—

13th—Ther. 79 Bar. 30.03* wind N. With heavy rain.
 14th—Ditto 79 ditto 28.84 (?) NW. to NE. a strong breeze.
 15th—Ditto 80 ditto 28.82 NE. rain and puffy wind.
 16th—Ditto 77½ ditto 28.84 NW. to SE., decreasing wind.
 17th—Ditto 78 ditto 28.82 NE. to NW. strong breeze with rain.
 18th—Ditto 80 ditto 29.00 SE. to NW. clearing up for fair weather.
 N.B.—Wind stronger to the southward of the hills south of Choramoon, also more rain to the southward than to the northward. On this coast no craft lost, but to the southward, at Choramoon, salt was hove overboard from two vessels, which ran into that river for safety.

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*Extract from the log of the Ship " Maidstone," Captain Wimble.*

*Thursday, 14th November, 1839. A. M.*—Squally, thick, unsettled weather. Noon, steady breezes from the north-eastward, and cloudy. At 3 P. M. sounded in corrected 29.956 43 fathoms. At 6h. 30m. saw the Light Vessel, bearing WNW. At 9h. 30m. came to in eight fathoms, veered to 40 fathoms of cable. Light bearing SE. Midnight, light winds and fine weather.

*Friday, 15th. A. M.*—Moderate breezes and cloudy. At 8, breeze increasing. At 11, strong breezes and cloudy, veered to 60 fathoms. Noon, more moderate. At 4, strong breezes and Bar. Corrected. dark cloudy weather, the Barometer falling, made  
 4 P. M. 29.75 all snug, veered cable to 80 fathoms. At 8,  
 8 29.77 strong breezes and cloudy weather. Midnight  
 12 29.69 strong breezes and squally, with a heavy swell from the south-eastward, wind E.

*Saturday, 16th A. M.*—Strong breezes and cloudy weather, wind  
 4 A. M. 29.75 EbN. At 4, ditto weather, with a heavy swell  
 8 29.80 from SE. Daylight, squally with heavy rain.  
 Noon 29.85 Noon, strong breezes, with heavy squalls and  
 4 29.85 rain. At 4, ditto weather. At 8, strong breezes  
 8 29.85 with constant heavy rain. Midnight, ditto wea-  
 Midnight 29.95 ther, with a heavy swell from the SE.

\* This should probably be 29° 30' or 29° 03'

*Saturday, 17th A. M.*—Strong breezes from EbS. cloudy with rain.

At 8, more moderate, with light rain. Noon,

6 A.M. Br. 29.95 fresh breezes from ESE. and cloudy weather.

Noon 29.90 P. M. Strong breezes and squally, with rain: At

Midnight 29.95 8, more moderate and fine. Midnight, fresh breezes and cloudy weather:

N. B. Captain Wimble having favoured me with the height of his Barometer, at noon, at Calcutta, I have been able to compare it with that of the Surveyor General's Office. I have corrected his for the small amount of error—05 which it had. It may be mentioned here, that this is the only instance in which out of thirty or forty requests during these researches, I have been enabled to obtain this very simple, but important datum!

I now place the extracts from the logs of the Honorable Company's Pilot Vessels and Floating Lights, in the form of Tables from the 14th to the 18th November, and these are followed by the valuable Barometrical observations of Mr. Hudson, of the Honorable Company's Floating Light Vessel "*Hope*," and those of the Surveyor General's Office at Calcutta.

| Date,<br>Civiltime. | Names of Vessels. | Situation.                                               | Winds, Weather, and Remarks.                                                                                                                                                                      |
|---------------------|-------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14th Nov.<br>1839.  | Beacon, F. L. V.  | Outer Station,.... .. { <sup>21 04</sup><br>88 27        | On 13th Moderate and fresh NE. and NNE. breezes and fine. On this day the wind veering gradually to the East and SE. At midnight moderate E. to ESE. breezes, and unsettled appearance all round. |
|                     | Krishna, P. V...  | Mid-Channel, Reef Buoy WbN, 2 miles.                     | NEbN. breeze and fine. During the night strong Easterly breeze, and swell from the Southward.                                                                                                     |
|                     | Seahorse, P. V... | Cruizing. Floating Light from<br>WNW. to NE. ....        | First part pleasant breezes North to NNE. latter fresh from ENE. to ESE.                                                                                                                          |
|                     | Jane, P. V. ....  | Cruizing. Floating Light Vessel<br>NNE to EbS. .... ..   | First and middle part pleasant breezes, NE. to ENE. latter variable and squally, with cloudy appearance to the North Eastward.                                                                    |
|                     | Hope, F. L. V. .. | At anchor, Inner Station.... { <sup>21 26</sup><br>88 07 | To 4 P.M. Moderate Northerly breezes. 8 P.M. Light Easterly breeze.                                                                                                                               |



| Date,<br>Civil time. | Names of Vessels.                  | Situation.                                                                                                                                                                                                               | Winds, Weather, and Remarks.                                                                                                                                                                                                |
|----------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15th Nov.<br>1839.   | Beacon, F. L. V....                | Outer Station, ....                                                                                                                                                                                                      | Fresh E. to ENE. breezes increasing to noon, with rain and squalls. 4 p.m strong ENE. breezes with squalls and threatening weather. At sunset E. to ENE, and heavy sea, NBE. The same at midnight, blowing hard from cable. |
| Krishna, P. V. ..    | Reef Buoy, WbN. 2' Mid-channel, .. | Strong Easterly wind and cloudy threatening appearance.                                                                                                                                                                  |                                                                                                                                                                                                                             |
| Seahorse, P. V. ..   | Cruizing. South Channel, ....      | NBE. wind. Very dirty appearance. Noon, increasing and threatening to Eastward. Made all snug.                                                                                                                           |                                                                                                                                                                                                                             |
| Jane, P. V. ...      | Under weigh. S. Channel Buoy NW.   | First part variable winds ENB. to ESE. Midnight, breeze increasing; very threatening appearance to the Eastward. later moderate gales ENE. to East. Threatening appearances all round. At anchor with 100 fathoms cable. |                                                                                                                                                                                                                             |
| Hope, F. L. V. ..    | At anchor, Inner Station, ....     | To 4 p.m. moderate and strong ENE. breezes, cloudy and squally from E. to SW. with a heavy swell from Eastward. 8 p.m. Unsettled weather, NE. to ENE. at midnight.                                                       |                                                                                                                                                                                                                             |

| Date,<br>Civil time.  | 16th Nov.<br>1839.       | Names of Vessels.    | Situation.                            | Winds, Weather, and Remarks.                                                                                                                                                                                                                                                                                                                      |
|-----------------------|--------------------------|----------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beacon F. L. V. . . . | Outer Station, . . . . . | Krishna, P. V. . .   | Mid-channel. Reel Buoy WBN. 2 miles,  | 4 a.m. blowing hard from E. to ENE. with heavy squalls of wind and rain, increasing at 4 a.m. from Eastward, and at daylight the same. Wind from E. to ENE. Noon the same, and cloudy to the SE. Sunset the same, with every appearance of a heavy gale. Midnight blowing very hard in heavy squalls of wind and rain, and threatening to the SE. |
|                       |                          | Seahorse, P. V. . .  | Cruizing between S. Channel and Point | Wind from E. to ESE. squally and rain. At noon at anchor on Point                                                                                                                                                                                                                                                                                 |
|                       |                          | Palmitras, . . . . . | Palmitras, . . . . .                  | Wind from E. to ESE. squally and rain. At noon at anchor on Point                                                                                                                                                                                                                                                                                 |
|                       |                          | Jane, P. V. . . . .  | At anchor, South Channel,             | First part fresh gales from EBN. to EBS. or ESE., middle from East; latter hard squalls from ENE. to ESE. with heavy rain at intervals; riding with 170 fathoms. At 4 p.m. gale increasing after a squall from Eastward; telegraphing vessels to stand out to sea.                                                                                |
|                       |                          | Hope, F. L. V. . .   | At anchor, Inner Station, . . . . .   | 4 a.m. fresh ENE. breezes, squally and drizzly rain, and strong set from the Eastward. Noon, strong Easterly breezes, squalls, and heavy swell from Eastward. 8 p.m. N.E. breezes decreasing fast. Midnight moderate Easterly winds and squally.                                                                                                  |

| Date,<br>Civiltime. | Names of Vessels.  | Situation.                                                      | Winds, Weather, and Remarks.                                                                                                                                                                             |
|---------------------|--------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17th Nov.<br>1839.  | Beacon, F. L. V..  | Outer Station, .. ..                                            | A.M. to Noon blowing fresh from E. to ENE. with heavy passing squalls and threatening to the SE. 4 P.M. to midnight, blowing fresh from E. to ESE, and SE. with heavy squalls and threatening to the SE. |
|                     | Krishna, P. V. ..  | Cruizing; and at anchor. Reef Buoy SWbW. F. L. SEbS.            | First and middle parts squally, with rain from East to SE. Latter light breezes East to SE. and cloudy.                                                                                                  |
|                     | Seahorse, P. V. .. | Off Point Palmiras, Northern part.                              | Variable from NE. to SE. and blowing weather. Stood to the Southward during the night. At 9 A.M. on Point Palmiras in 19 fathoms. At 10 A.M. wind abating. 3 P.M. Wind SE. falling light.                |
|                     | Jane, P. V. ..     | At anchor South Channel. Latterly, F. L. V. SE $\frac{1}{2}$ E. | First part strong breezes EbN. to ESE. Middle very squally; latter moderate breezes from ESE. with occasional squalls, and very threatening appearances to the Eastward. 1 P.M. Wind ESE.                |
|                     | Hope, F. L. V. ..  | At anchor, Inner Station, ..                                    | Moderate Easterly breezes from EbS. to ENE. dark, gloomy and squally, with frequent showers of rain. Noon as before. 4 P.M. Moderating. 8 P.M. Moderate NE. Midnight. Ditto Easterly.                    |



| Date,<br>Civil time. | Names of Vessels.       | Situations.                                                                 | Winds, Weather, and Remarks.                                                                                                                                                             |
|----------------------|-------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18th Nov.<br>1839.   | Beacon, F. L. V.        | Outer Station,      ....      ..      ..                                    | A.M. to noon moderate E. to ESE. and S. with passing squalls and unsettled appearances. Daylight, wind SE. 4 P.M. till midnight SE. to S. and heavy appearances to SE. On the 19th fine. |
|                      | Jane, P. V      ....    | Under weigh. F. L. V. about SSE.      ..      ..                            | Throughout the day squalls, with copious rain from E to S. and SSW.                                                                                                                      |
|                      | Hope, F. L. V.      ..  | At anchor, Inner Station,      ..      ..                                   | Moderate NE. breeze and cloudy, 12h. 30m. squally. Wind veered to South. 1h. 30m. heavy squalls from SW. 2 P.M. wind veered to Eastward.                                                 |
|                      | Seahorse, P. V.      .. | South Channel,      ..      ..                                              | Light breezes ESE. to SE. and SbE. with squalls and rain in first part.                                                                                                                  |
|                      | Krishna, P. V.      ..  | At anchor F. L. SE $\frac{1}{2}$ E.      Reef Buoy<br>SWbW.      ..      .. | First part light Easterly winds, middle SE. winds and rainy. At 12h. 30m. P.M. the wind suddenly shifted to the Eastward. Latter part light SSE. wind.                                   |

*Barometrical Observations, Honorable Company's Floating Light Vessel "Hope," Captain Hudson, Lat. 21° 26', Long. 88° 17'.*

| Date.     | Time.  | Bar.  | Ther. |                                                            |
|-----------|--------|-------|-------|------------------------------------------------------------|
| 14th Nov. | 8 A.M. | 29.95 | 72    | Moderate NE. hazy.                                         |
|           | Noon,  | 96    | 76    | Ditto Northerly, ditto.                                    |
|           | 8 P.M. | 95    | 80    | Light breeze from Eastward.                                |
| 15th Nov. | 8 A.M. | 29.91 | 75    | Moderate ENE. squally to Southward.                        |
|           | Noon,  | 92    | 76    | Strong ENE. cloudy.                                        |
|           | 4 P.M. | 86    | 76    | Ditto ditto ditto.                                         |
|           | 8 P.M. | 92    | 76    | Moderate NE. and squally.                                  |
| 16th Nov. | 8 A.M. | 29.90 | 75    | First ENE. and squally.                                    |
|           | Noon,  | 92    | 77    | Strong Easterly breezes and unsettled.                     |
|           | 8 P.M. | 92    | 78    | N.Easterly winds decreasing fast.                          |
| 17th Nov. | 8 A.M. | 29.94 | 77    | { Moderate Easterly winds, gloomy, and<br>squally weather. |
|           | Noon,  | 95    | 78    |                                                            |
|           | 4 P.M. | 88    | 77    | Ditto ditto, thick gloomy weather.                         |
|           | 8 P.M. | 92    | 77    | Ditto ditto ditto.                                         |
| 18th Nov. | 8 A.M. | 29.94 | 77    | Moderate Easterly, and cloudy weather.                     |
|           | Noon,  | 98    | 79    | Ditto ditto ditto.                                         |
|           |        | 92    | 78    | Light Southerly breezes, cloudy.                           |

*Meteorological Register kept at the Surveyor General's Office,  
Calcutta, 1839.*

| Nov. | Bar. Noon. | Ther. |              |                         |
|------|------------|-------|--------------|-------------------------|
|      |            | °     |              |                         |
| 12   | 29.994     | 81.0  | N. . . . .   | Cloudy, faint Sunshine, |
| 13   | 30.018     | 84.5  | N. . . . .   | Clear,                  |
| 14   | 29.970     | 84.0  | N. . . . .   | Partial Haze,           |
| 15   | .952       | 86.0  | E. . . . .   | Cumuli and Haze,        |
| 16   | .972       | 81.0  | EbS. . . . . | Cloudy,                 |
| 17   | .976       | 82.1  | S. . . . .   | Cloudy,                 |

For more convenient reference, and as marking some striking contrasts, I have collected the whole of the foregoing logs and reports, with the exception of that from the Baramah Survey, into the following tabular views, which comprise the winds and weather, &c. at each position, at Noon, Civil time, of the day to which they refer.

| Civil time. | Date,<br>12th, Nov.<br>1839.   | Names of Vessels<br>and places.      | Wind and Weather,                                      | Lat. N. | Long E. | Bar.  | Simp. | Ther. | Remarks.                                                                |
|-------------|--------------------------------|--------------------------------------|--------------------------------------------------------|---------|---------|-------|-------|-------|-------------------------------------------------------------------------|
|             | At Noon<br>12th, Nov.<br>1839. | Brig Arethusa, ....                  | Strong increasing<br>breezes ENE.<br>.....<br>squally, | 16 34   | 84 20   | ..    | ..    | ..    | { 8 A. M. appearance of a gale. In-<br>creasing since noon of 11th Nov. |
|             |                                | Balguerie, Fr. ....                  | W. to NW. heavy<br>squalls and rain, ..                | 11 36   | 90 20   | 28.95 | ..    | ..    | { Constant rain, squalls from<br>NNW. at times.                         |
|             |                                | Duke of Bedford,                     | SE. Fine, .....                                        | 11 41   | 91 21   | 30.0  | ..    | 82    |                                                                         |
|             |                                | Cashmere Merchant,                   | Lt. breezes increasing<br>from NEB. to ESE             | 16 58   | 92 25   |       |       |       |                                                                         |
|             |                                | Sumatra, .....                       | ENE. Fresh breeze,                                     | 15 29   | 91 02   |       |       |       |                                                                         |
|             |                                | At Vizagapatam,                      | NE. Fresh NE.<br>Monsoon, .....                        |         |         |       |       |       |                                                                         |
|             |                                | Ganges, (H. C.<br>Steamer), ....     | EbN. Fresh breeze,                                     | 18 09   | 88 33   | ..    | ..    | ..    | { Increasing P. M. and till midnight<br>ENE. dark gloomy weather.       |
|             |                                | At Pooree, or Jug-<br>gurnath, ..... | NE. to E. cloudy, ..                                   | 19 48   | 85 45   | ..    | ..    | 81    |                                                                         |
|             |                                | At CALCUTTA, ....                    | N. Cloudy, faint sun-<br>shine, .....                  | 22 34   | 88 22   | 29.99 |       |       |                                                                         |



| Date,<br>Civil time.        | Names of Vessels and Places. | Winds and Weather.                              | Lat. N. | Lon. E.        | Bar.  | Simp. | Ther. | Remarks.                                                                                                                                                               |
|-----------------------------|------------------------------|-------------------------------------------------|---------|----------------|-------|-------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Noon,<br>13th Nov.<br>1839. | Arethusa, .....              | NE. fresh gale heavy squalls,                   | 15 52   | 85 18          |       |       |       | 11 A.M. a heavy squall<br>laying the Brig on her beam-<br>ends for 15 or 20 minutes.<br>Every appearance of an ap-<br>proaching gale. Under double<br>reefed topsails. |
|                             | Ft. S. Balguerie, .....      | S.W. blowing strong; ..                         | 13 15   | 90 00          | 29.66 |       |       | Considerable sea rising.                                                                                                                                               |
|                             | Duke of Bedford, .....       | SSE. to EBS. squalls & rain,                    | 14 49   | 90 22          | 29.90 | 81    |       | P.M. heavy squalls SSE. mid-<br>night Bar. 29.80.<br>Every appearance of a gale.<br>Hove to 4 P.M.                                                                     |
|                             | Rosalind, .. ..              | NNE. sqly. cloudy, strong gale                  |         |                |       |       |       | Preparing for bad weather.                                                                                                                                             |
|                             | Cashmere Merchant, ....      | East varying to ENE. ....                       | No Obs. | 15 22<br>85 05 |       |       |       |                                                                                                                                                                        |
|                             | Ripley, .....                | ENE, fresh gales, .. ..                         | 17 41   | 90 42          |       |       |       |                                                                                                                                                                        |
|                             | Ft. S. Sumatra, .. ..        | ENE, fresh Monsoon, ..                          |         |                |       |       |       |                                                                                                                                                                        |
|                             | At Vizagapatam, .. ..        | ENE, hard gales, dark gloomy                    |         |                |       |       |       |                                                                                                                                                                        |
|                             | H. C. St. Ganges, .. ..      | ENE, fresh gales, .. ..                         | 16 21   | 88 51          |       |       |       | Very high sea; all snug for a<br>gale. Bar. 29.0 at 6 P.M.                                                                                                             |
|                             | H. C. St. Enterprise, ..     | Weather threatening from the<br>Eastward, .. .. | 20 10   | 92 58          |       |       |       | At anchor at Akwab.                                                                                                                                                    |
|                             | Helen, .....                 | NE. to ENE, moderate breezes,                   | 19 00   | 88 30          |       |       |       | All sail set.                                                                                                                                                          |
|                             | H. C. S. Amherst, .....      | North, threatening, ..                          | 20 10   | 92 58          |       |       |       | At anchor in Akwab.                                                                                                                                                    |
|                             | At Pooree, or Juggurnath,    | NE. fresh breeze and fine<br>weather. ....      | 19 48   | 85 45          |       |       |       |                                                                                                                                                                        |
|                             | H. C. B. Hattrass, .. ..     | NE. moderate and cloudy, ..                     | 21 26   | 90 47          | 29.97 | 78½   |       | Surveying vessel.                                                                                                                                                      |
|                             | At Balasore, .. ..           | North, with heavy rain, ....                    | 21 28   | 87 10          | 30.63 |       |       |                                                                                                                                                                        |
|                             | Beacon, F. L. V. ....        | NE. and NNE. breezes mo-<br>derate and fine, .. | 21 04   | 88 27          |       |       |       | At anchor.                                                                                                                                                             |
|                             | At CALCUTTA, .....           | North, clear weather, .....                     | 22 34   | 88 22          | 30.02 |       | 84.5  |                                                                                                                                                                        |

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| Date,<br>Civil time.        | Names of Vessels<br>and Places. | Winds and Weather.                                                  | Lat. N. | Lon. E. | Bar.     | Simp. | Ther. | Remarks.                                                        |
|-----------------------------|---------------------------------|---------------------------------------------------------------------|---------|---------|----------|-------|-------|-----------------------------------------------------------------|
| Noon.<br>14th Nov.<br>1839. | Arethusa, ...                   | NE. Strong increasing gales with frequent heavy squalls & rain, ... | 15 50   | 5 46    | 29.64    |       |       | Very high sea. Vessel labouring much.                           |
|                             | Fr. S. Balguerie ...            | NE. with strong squalls & rain, ... and rain, ...                   | 16 20   | 88 54   |          |       |       | A heavy confused sea.                                           |
|                             | Duke of Bedford, ...            | Blowing in heavy gusts from Eastward, ...                           | 17 35   | 90 20   | 29.80    |       |       | { Prepared for bad weather. 4 p.m. Barometer 29.70.             |
|                             | Rosalind, ...                   | About NNE. hard gales and stormy weather. ...                       |         |         |          |       |       | Tremendous cross sea—lying to.                                  |
|                             | Cashmere Merchant, ...          | ESE. increasing gales, ...                                          |         |         |          |       |       | No observation.                                                 |
|                             | Ripley, ...                     | North. Heavy gale and squalls, ...                                  | 14 30   | 85 21   | 29.65    |       | 75    | { Under close reefed main-topsail. p. m. veering to NW. and NW. |
|                             | Fr. S. Sumatra, ...             | ENE. increasing breeze with rain, ...                               | 19 08   | 89 49   |          |       |       | { Squally appearance in the SE. with a swell.                   |
|                             | Jane, ...                       | No report at Noon, ...                                              | 17 10   | 89 20   |          |       |       | Gale commenced at 10 p.m.                                       |
|                             | At Vizagapatam, ...             | Fresh NE. monsoon, brassy sky, ...                                  | 17 42   | 83 26   | 29.20    |       |       | { Weather apparently clearing. 1 p.m. wind SE. to S. heavy sea. |
|                             | H. C. St. Ganges, ...           | About SE. dark gloomy weather, ...                                  | 15 37   | 88 38   |          |       |       | At Akwab.                                                       |
|                             | Enterprise, ...                 | Threatening from Eastward, ...                                      | 20 10   | 92 58   |          |       |       | At Akwab.                                                       |
|                             | Helen, ...                      | ENE. steady breezes, ...                                            | 20 10   | 88 35   |          |       |       | { wind SE. to S. heavy sea.                                     |
|                             | H. C. S. Amherst, ...           | Light NNW. to NE. and threatening to West, ...                      | 20 10   | 92 58   | 29.90    |       |       | Appearances of a gale and heavy sea                             |
|                             | At Pooree, ...                  | NE. Moderate and fine, ...                                          | 19 48   | 86 45   |          |       |       | { outside.                                                      |
|                             | At Chittagong, ...              | NNE. to SE. variable and cloudy, ...                                | 22 20   | 91 51   |          |       |       | At Akwab.                                                       |
|                             | H. C. Brig Hatrass, ...         | NbE. moderate and cloudy, ...                                       | 21 20   | 90 56   | 29.95    |       | 80½   | At Akwab.                                                       |
|                             | At Balasore, ...                | About North, strong breeze, ...                                     | 21 28   | 87 10   | 28.84(?) |       | 79    | At Akwab.                                                       |
|                             | Maidstone, ...                  | NE. Steady breeze and cloudy, ...                                   | 21 04   | 88 27   | 29.96    |       |       | At night strong Easterly breeze, swell from Southward.          |
|                             | Beacon, F. L. V. ...            | About NE. Unsettled appearance, ...                                 |         |         |          |       |       | { At night strong Easterly breeze, swell from Southward.        |
|                             | Krishna, P. V. ...              | NbE. N. and fine, ...                                               |         |         |          |       |       |                                                                 |
|                             | Seahorse, P. V. ...             | About NNE. pleasant breezes, ...                                    | 21 26   | 88 07   | 29.96    |       |       |                                                                 |
|                             | Hope, L. V. ...                 | Northerly breezes moderate, ...                                     |         |         |          |       |       |                                                                 |
|                             | At CALCUTTA, ...                | North. Partial haze, ...                                            | 22 34   | 88 22   | 29.97    |       | 84    |                                                                 |

| Date,<br>13th, Nov.<br>1839. | Time. | Names of Vessels<br>and Places. | Winds and Weather.                           | Lat. N.   | Lon. E. | Bar.  | Simp. | Ther. | Remarks.                                                                                 |
|------------------------------|-------|---------------------------------|----------------------------------------------|-----------|---------|-------|-------|-------|------------------------------------------------------------------------------------------|
| Noon.                        |       | Arethusa, ...                   | WNW, severe heavy gale, frequent squalls,    | 14 00 (?) | 86 06   |       |       |       | (2 P.M. Hurricane WNW. At 4 P.M. "Vesta" set on her broadside with wind at WSW.          |
|                              |       | Fr. S. Balguerie, ...           | NE. to NNE. cloudy squally weather,          | 17 56     | 87 50   | 29.74 |       |       | A good deal of sea.                                                                      |
|                              |       | Duke of Bedford, ...            | East blowing hard—rain, ...                  | 18 20     | 89 05   | 29.90 | 80    |       | Torrents of rain throughout, and vivid lightning.                                        |
|                              |       | Cashmere Merchant, ...          | ESE. Strong gales, ...                       | 17 33     |         |       |       |       | Strong gales, heavy squalls and rain.                                                    |
|                              |       | Rosalind, ...                   | About SWBs, Hurricane and rain, ...          |           |         |       |       |       | Sprung mainmast. Tremendous sea and vivid lightning. Wind veering all round the compass. |
|                              |       | Hipley, ...                     | NWPW, Hurricane.                             | 13 55     | 85 58   | 29.23 | 73    |       | Lying to under storm-ttrysail—sea smoother—wind veering by 4 P.M. to West.               |
|                              |       | Fr. S. Sumatra, ...             | ENE. increasing gale, dark, rainy weather,   | 18 57     | 89 34   |       |       |       | Lying to.                                                                                |
|                              |       | Jane, ...                       | East? gale from the East.                    | 17 42     | 83 26   |       |       |       | Appearances threatening.                                                                 |
|                              |       | At Vizagapatam, ...             | N.E. fresh monsoon, red brassy sky,          | 16 17     | 83 26   | 29.20 |       |       | In Vizagapatam roads.                                                                    |
|                              |       | Indian Queen, ...               | N.E. strong breezes and cloudy weather,      | 17 42     | 83 26   |       |       |       | At Vizag.                                                                                |
|                              |       | H. C. Sr. Ganges, ...           | SE. gale moderate, dark cloudy weather,      | 20 10     | 92 58   |       |       |       | Stood to sea from the floating Light.                                                    |
|                              |       | Helena, ...                     | Easterly, threatening weather,               | 20 10     | 92 58   |       |       |       | Leaving Akayab at Noon, heavy swell from South.                                          |
|                              |       | H. C. S. Amherst, ...           | NE. moderate and light airs but threatening, | 20 10     | 92 58   | 29.80 |       |       |                                                                                          |
|                              |       | At Pooree, ...                  | NEBE. Strong breeze, cloudy and rain,        | 19 48     | 85 45   |       |       |       |                                                                                          |
|                              |       | At Chittagong, ...              | Variable NNE. to SE. cloudy, slight rain,    | 22 20     | 91 51   | 29.90 | 78    |       |                                                                                          |
|                              |       | H. C. S. Hatteras, ...          | NE. more moderate without rain,              | 21 20     | 90 56   | 28.82 |       |       |                                                                                          |
|                              |       | At Balasore, ...                | NE. rain and puffing wind,                   | 21 28     | 87 10   |       |       |       |                                                                                          |
|                              |       | Maldstone, ...                  | E.NE. Strong breeze and cloudy,              | 21 00     | 88 23   | 29.96 |       |       | (At anchor near F. Light. Bar. falling. Threatening weather.                             |
|                              |       | F. T. V. Beacon, ...            | E.NE. Strong breeze squalls and threatening, | 21 04     | 88 27   |       |       |       | Heavy sea rising.                                                                        |
|                              |       | Krishna P. V. ...               | Easterly breeze strong, threatening,         | 21 04     | 88 27   |       |       |       | At anchor. Heet Buoy Wb.N.                                                               |
|                              |       | Seahorse P. V. ...              | NEBE. (?) increasing and very dirty,         | 22 34     |         |       |       |       |                                                                                          |
|                              |       | Jane P. V. ...                  | threatening,                                 | 21 26     | 88 07   | 29.92 | 76    |       | Cruising, South Channel.                                                                 |
|                              |       | Hope, R. L. V. ...              | E.NE. moderate gale, threatening,            | 22 34     |         |       |       |       | At anchor, 100 fathoms cable out.                                                        |
|                              |       | At Calcutta, ...                | East, cloudy and hazy,                       |           |         |       |       |       | Heavy sea from Eastward.                                                                 |



| Date,<br>Civil time.        | Names of Vessels and places. | Winds and Weather.                                   | Lat. N. | Lon. E. | Bar.  | Simp. | Ther. | Remarks.                                                                 |
|-----------------------------|------------------------------|------------------------------------------------------|---------|---------|-------|-------|-------|--------------------------------------------------------------------------|
| Noon.<br>16th Nov.<br>1839. | Arethusa, ....               | S. E. and fine, ....                                 | 15 12   | 85 09   |       |       |       | Gale decreasing from midnight.                                           |
|                             | Fr. S. Balguerrie, ...       | E. to ESE. fine, ....                                | 20 18   | 88 49   | 28.90 |       |       | Gale decreasing from midnight.                                           |
|                             | Duke of Bedford, ....        | East blowing fresh, ....                             | 18 20   | 89 05   | 29.90 |       | 80    | P.M. clearing up.                                                        |
|                             | Cashmere Merchant, ...       | ESE. fresh breezes and clear,                        | 17 29   | 92 25   |       |       |       |                                                                          |
|                             | Rosalind, ....               | About SbW. ....                                      | 16 15   |         |       |       |       | { Moderating and clearing up.                                            |
|                             | Ripley, ....                 | SEbS. fresh breeze and clear<br>weather, ....        | 15 38   | 86 56   | 29.75 |       | 80    | { At 9 A.M. made sail.<br>Moderating at midnight of 15th.                |
|                             | Fr. S. Sumatra, ..           | ESE. clearing up, ....                               | 18 48   | 89 12   |       |       |       |                                                                          |
|                             | At Samulcottanear Coringa,   |                                                      |         |         |       |       |       | { Hurricane commenced at 10 at<br>night.                                 |
|                             | At Hope Island Lighthouse    | NE. blowing fresh, drizzling                         | 16 51   | 82 16   |       |       |       | { Shifted to NNW. at 1 P.M.                                              |
|                             | off Coringa, ....            | rain, ....                                           |         |         |       |       |       | { NW. 2 P.M. 10 P.M. Hurri-<br>cane at NE.                               |
|                             | Jane, ....                   | SE. cleared up, ....                                 |         |         |       |       |       |                                                                          |
|                             | At Vizagapatam, ....         | About NNE. heavy gusts of<br>wind and rain, ....     | 17 42   | 83 26   |       |       |       | { Strength of gale at 10 A.M.—<br>veering to Eastward in the<br>evening. |
|                             | Indian Queen, ....           | NE. Strong gales, drizzling<br>rain, ....            |         |         |       |       |       | { Increasing gale hove to under<br>main-trysail, and made all snug.      |
|                             | H. C. Sr. Ganges, ....       | EbS. moderate and fair, ....                         | 18 16   | 90 55   |       |       |       | Bar. 8 A.M. 29.50.                                                       |
|                             | Helen, ....                  | Easterly fresh gls.&heavy sqs ,                      |         |         |       |       |       | Standing to sea from pilot station.                                      |
|                             | H. C. S. Amherst, ....       | East, moderating, but threaten-<br>ing to ESE. ....  | 20 48   | 90 13   | 29.91 |       |       | { Cross lumbering swell from<br>ESE.                                     |
|                             | At Pooree, or Juggurnath,    | About NEbE. Strong breeze,                           | 19 48   | 85 45   |       |       |       |                                                                          |
|                             | H. C. S. Hattrass, ....      | NE. light breeze and cloudy,                         | 21 20   | 90 56   | 29.93 |       | 78½   |                                                                          |
|                             | At Balasore, ..              | NE. to NW. Strong brz. & rain                        | 21 28   | 87 10   | 28.82 |       | 77½   |                                                                          |
|                             | Maidstone, ....              | EbN. Strong breezes, heavy<br>squalls and rain, .... | 21 00   | 88 23   | 29.85 |       |       | At anchor.                                                               |
|                             | F. L. V. Beacon, ...         | EbN. blowing hard—heavy<br>squalls and rain, ....    | 21 04   | 88 27   |       |       |       | { Cloudy to SE. every appear-<br>ance of a heavy gale.                   |
|                             | Krishna, P. V. ....          | E. Strong winds cloudy & rain.                       |         |         |       |       |       | Reef Buoy WbN. 2.                                                        |
|                             | Seahorse, P. V. ....         | About EbS. squalls and rain,                         |         |         |       |       |       | Near point Palmiras.                                                     |
|                             | Jane, P. V. ....             | E. hard squalls and heavy rain.                      |         |         |       |       |       | At anchor S. Channel.                                                    |
|                             | F. L. V. Hope, ....          | East Strong squalls unsettled<br>weather, ....       | 21 26   | 88 07   | 29.92 |       | 77    | { Heavy swell from Eastward                                              |
|                             | At CALCUTTA, ....            | EbS. Cloudy, ..                                      | 22 34   | 88 22   | 29.97 |       | 81    | { P.M. wind decg fast from NE.                                           |

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| Date,<br>Civil time.        | Names of Vessels and places.                    | Winds and Weather.                       | Lat. N.<br>° / | Lon. E.<br>° / | Bar.  | Simp. | Ther. | Remarks.                                                |
|-----------------------------|-------------------------------------------------|------------------------------------------|----------------|----------------|-------|-------|-------|---------------------------------------------------------|
| Noon,<br>17th Nov.<br>1839. | Arethusa, ....                                  | SE. fine breeze, .. ..                   | 17 33          | 86 05          |       |       |       | { A current of 60 to the North-<br>ward since the 14th. |
|                             | Duke of Bedford, .....                          | Easterly light breeze, .....             | 20 42          | 89 45          | 30.05 |       |       |                                                         |
|                             | Cashmere Merchant, ....                         | ESE. to SE, ....                         | 16 37          | 92 78          |       |       |       |                                                         |
|                             | Ripley, ....                                    | SE. settled fine, ....                   |                |                |       |       |       | Hurricane heavy; lasted to 4 A.M.                       |
|                             | Fr. S. Sumatra, .. ..                           | EbS. moderating to fine weather, P.M.    | 19 30          | 89 30          |       |       |       |                                                         |
|                             | At Samulcoffa, .. ..                            | Southward, moderating, ....              |                |                |       |       |       |                                                         |
|                             | At Hope Island Lighthouse,<br>off Coringa, .... | Moderating.                              | 16 51          | 82 16          |       |       |       | Hurricane abating at 6 A.M.                             |
|                             | At Vizagapatam, .. ..                           | South moderate, .. ..                    | 17 42          | 83 26          |       |       |       |                                                         |
|                             | Indian Queen, .. ..                             | SW. strong breeze, .. ..                 |                |                |       |       |       |                                                         |
|                             | Helen, .. ..                                    | SEbE. clear, .. ..                       | 20 22          | 87 25          |       |       |       | At Anchor.                                              |
|                             | At Pooree, .. ..                                | ENE. light winds, ....                   | 19 48          | 85 45          | 29.92 |       | 81    |                                                         |
|                             | H. C. S. Hatrass, .....                         | NE. Light winds and fine, ..             | 21 20          | 90 56          | 28.84 |       | 78    |                                                         |
|                             | At Balasore, .. ..                              | NW. to SE. decreasing wind,              | 21 28          | 87 10          | 29.95 |       |       | { Off Northern part Point Pal-<br>miras.                |
|                             | Maldstone, ....                                 | ESE. fresh breeze, cloudy, ..            | 21 00          | 88 23          |       |       |       |                                                         |
|                             | F. L. V. Beacon, ....                           | East to ENE. passing heavy squalls, .... | 21 04          | 88 27          |       |       |       |                                                         |
|                             | Krishna, P. V. .. ..                            | E. to SE. fresh breeze squally,          |                |                |       |       |       |                                                         |
|                             | Seahorse, P. V. ....                            | About ESE. abating. ....                 |                |                |       |       |       |                                                         |
|                             | Jane, P. V. .. ..                               | ESE. squally, ....                       | 21 26          | 88 07          | 29.95 |       | 78    |                                                         |
|                             | Hope, F. L. V. .. ..                            | Easterly, gloomy, ....                   | 22 34          | 88 22          | 29.97 |       | 82    |                                                         |
|                             | At CALCUTTA, .. ..                              | South, cloudy, ....                      |                |                |       |       |       |                                                         |

## HURRICANE OFF THE PREPARIS, 21st Nov. 1840.

A little hurricane experienced by the "Cashmere Merchant," between the Island of Preparis and Point Negrais, is one of singular interest, for it much reminds us of the smaller whirlwinds seen on shore in tropical countries. By projecting the vessel's track and drift, it appears that this vortex—and it clearly was one—could not at the most have exceeded sixty miles in breadth. Its centre must have passed very close to the ship. The direction in which it was travelling, also differs from that of the preceding storm, being about NbW., and in this it approximates to the September one. We have no farther notice of this storm from any quarter. I have marked it upon the chart, and the following is the extract from the "Cashmere Merchant's" log.

*Extract from the log book of the Bark "Cashmere Merchant," Capt.*

*F. G. Warren ; reduced to Civil time.*

*On 20th Nov.—At 5 A. M.* the Island of Preparis bore SE. about five or six miles distant. To noon calm. P. M. strong breezes and heavy squalls ENE. till midnight ; standing to the NNW.  $30\frac{1}{2}$  miles, and to the NNE.  $14\frac{1}{2}$  miles till midnight.

*21st November.—Midnight,* strong gales EbN. with a heavy sea. Noon increasing to heavy gale at eastward, veering to north. 1 P. M. Wind North to NE. At 5, P. M. heavy gales. At 9 P. M. wind flew round to the westward, being about NW. with a complete hurricane, and cross-sea ; vessel thrown on her beam-ends, all the canvas blown from the yards, five shrouds of the main, and three of the fore rigging being carried away, and water up to the hatches on deck ; cut away top-gallant mast and yards, and sails from the yards to save the ship ; sea making a clear breach over her. At midnight wind west ; vessel lying on her broadside, working much, and making much water. At 5 P. M. the wind was WSW. having moderated from about 2 A. M. Noon, wind NE. bore away for Coringa being leaky, and too much damaged to reach Rangoon. Lat. by observation  $16^{\circ} 4' N$ .

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We have now to consider what is the amount of the knowledge to be deduced from these data,—how it agrees with the theory,—and how the evidence goes to prove the track which I have laid down for the Coringa storm. I may refer here to what I have said in the preceding memoir, p. 585, Journal of the Asiatic Society, for June 1839, on the

subject of the uncertainty which besets us, either from the state of the weather, or other causes, rendering it impossible to ascertain exactly the ship's position, or the true direction of the wind. I may add here, that we should further consider, that in a circle of 320 miles circumference, or about 100 in diameter, each point of the compass includes an area of ten miles, which may be considered as a trifling error in a vessel's reckoning in bad weather, so that if the wind be marked a point wrong, and the vessel's situation also be only ten miles wrong, *and both these errors the same way*, we may thus find a considerable discrepancy appearing where none really existed. I mention this for the information of those, who might perhaps look for more mathematical exactness than our data will allow, and because I am desirous of shewing how important correct observations are to us in tracing out, step by step, the truths or probabilities which we deduce from them.

It will be more convenient to consider this storm under the following heads.

I.—The formation of the vortex, or circle of the tempest, and evidence for its form.

II.—Its size.

III.—Its rate of progression.

I.—The formation of the vortex, or circle of the tempest, and evidence for its form.

We find that on the 12th at noon, (Diagram No. I.,) the Duke of Bedford, Balguerie, Sumatra, and Cashmere Merchant, were all on the eastern side of the Bay, between Lat. $11^{\circ} 30'$ and $17^{\circ} 00' N.$ and long. $90^{\circ} 00' E.$ and $92^{\circ} 30' E.$ Of these, we find the Sumatra with the wind at ESE., and the Balguerie with it at WNW. both with a strong breeze, and from this last being opposed to the usual monsoon current of that season (which is from the northeastward) we may suppose a vortex to be commencing. The monsoon seems to have been blowing steadily all across the bay, at least from the lat. of 14° , for we find on this day the Arethusa two degrees to the eastward of Coringa, and the Ganges Steamer in the middle of the Bay, in about $18^{\circ} 30' N.$, all with the winds between East and ENE. We may then conclude that the disturbing force, whatever this was, had only began to operate below the latitude of 13° , and near the Andaman Islands, and that its centre, deduced from the positions of the Balguerie and Sumatra, was about where I have placed

it for that day ; in say $13^{\circ} 30'$ N. and 92° E. The SE. wind experienced by the "Duke of Bedford" is scarcely an anomaly, because of her proximity to the Andaman Islands ; the mountains of which, being some of them 2000 feet high, may have operated, as all high ranges of land seem to do, by deflecting the winds into a different course. I have therefore rejected her log for that day. The "Cashmere Merchant" seems also out of the influence of the vortex, and too near the coast of Tenassarim. The centre, if there was one, might have been further north or south, but I have preferred placing it nearly on a line with the general direction of the tempest on the following day. Could we have obtained from these ships a single observation when in Calcutta, so as to test the accuracy of their barometers by a standard, these observations would have been far more valuable ; but as I have before observed p. 420, I could only obtain this in one instance out of about thirty applications made, while collecting information for the present memoir.

2. On the 13th we find the circle in some degree formed, for we have, as will be seen by the Diagram No. II, and tables

Wind.

The Ganges,	ENE.	..	Hard gale, high sea,
The Bedford, ...	ESE.	..	Heavy squalls and Bar. falling,
Balguerie,	SW.	..	Blowing strong, sea rising,

and with their positions on the chart, this will give the centre of the vortex, if there was one, about where I have placed it, in lat. $13^{\circ} 42'$ N. long. $89^{\circ} 47'$ E.

The "Sumatra" seems to have run out of the influence of the vortex to the northward, and having no barometer, we cannot refer to its height. The storm can scarcely be said on this day to have reached the "Arethusa," "Ripley," and "Rosalind."

It is worth noticing, that the three ships first mentioned had all been running *towards* this point from noon of the 12th, and the changes of wind which they had since that date are exactly such as ought to occur if a vortex had been forming, moving onward in the direction laid down, and they had been running into it.

We have for the Barometers, that of—

The Ganges, 29.00 at 6 P. M. at which time she was about on the meridian of the centre.

The Bedford, .. 29.90, being 00.10 *higher* than on the 12th, the centre having passed her.

The Balguerie, . . 29.66, being also 00.71 *higher*, than on the 12th.

We have unfortunately no comparisons in Calcutta for these Barometers; if we had so, they might have proved of great value. That of the "Ganges" was probably too low.

On the 14th, at noon, we have (Diagram, No. III.)

Ganges, wind about SE. clearing a little, heavy sea, Bar. 29.20.

Arethusa, NE. increasing strong gales and squalls.

Ripley, North, heavy gales, 29.65.

Rosalind, about NbE. hard gales and stormy.

The "Bedford" it is worth remarking, had her barometer again falling on this day, with very heavy weather from the eastward. The above winds, and positions of the ships, place the centre in about $14^{\circ} 28' N.$ $87^{\circ} 11' E.$

On the 15th, at noon, we have (Diagram, No. IV) the "Arethusa" on her beam ends, in a hurricane which veered in 18 hours—or from 3 A. M. when it was at NE. to 9 P. M. when it was at SSW. and moderating—22 points; or about $1\frac{1}{4}$ point in an hour. I presume that she must have been blown round the western side of the vortex, though so far clear of its centre, that the calm which is usually found when the ships cross the centre, and experience *sudden* shifts, did not occur with her. The "Ripley" we find also in pretty nearly a hurricane as to the force of the wind. Her barometer as low as 29.25 at noon, when we find the wind WNW. veering to WSW. by 6 P. M., or about four points in six hours, or at the rate of about $\frac{3}{4}$ of a point in an hour; from which we should conclude, she was farther from the centre than the, "Arethusa." The "Rosalind" had a hurricane at from WbN. at 2 A. M. to SW. and SSW. at 1 P. M., or veering seven points in 11 hours, or also about $\frac{3}{4}$ of a point in an hour; from which coincidence, and the direction of the wind, I have placed her on the same circle as the "Ripley," having most unfortunately no better datum to go by.

We have thus on this day, curiously enough, three ships blown each half or two-thirds round a circle! For the unprofessional reader should be told, that in weather such as is described in the vessels logs, of which I have always carefully preserved the expressions, a vessel does little more than drift bodily to leeward, as the wind veers with her.

It will be observed, as to the extent of the storm, that the "Ganges," and "Balguerie" had both the weather moderating, and were getting farther from the centre. The "Bedford" and "Cashmere Merchant," how-

ever, had still very heavy weather, but this was in the vicinity of the coast, and not *against* the usual direction of the monsoon at this period of the year; another instance in which, while a hurricane was fairly formed, and travelling across the Bay, the monsoon also rises to the strength of a heavy gale, as in the case of the hurricane of June, in my first memoir. To the eastward we find that the "Indian Queen" on this day was discharging cargo at Vizagapatam, and that the red appearance noted there, is the only indication of any change of weather, in the absence of the barometer.

On the 16th we find that the "Ripley," "Arethusa," and "Rosalind" had all fine weather, and again by noon they had borne up and made sail, so that the hurricane must have moved very rapidly past them, and have been of small extent. We have for this day's data the somewhat vague accounts from Vizagapatam, Coringa, and the Hope Island Lighthouse, but fortunately also the "Indian Queen's" log.

That of the "Jane" is very imperfect; the circle or its influence seems to have been just reaching Vizagapatam at noon; for we find that during the morning "it veered to the northward, and blew hard the whole day, *varying* from NE. to north, mostly north; the strength of the gale blowing about 10 A.M., and that in the evening the wind veered back to the eastward; blowing steadily all night from ENE. to east," showing that the centre of the vortex had passed somewhere to the south.

At Coringa itself we find some discrepancy in the simple report of the Collector, and that of the Lighthouse-keeper on Hope Island, which bears from the flag staff on Coringa, about EbS. distant five miles. This last report would place the centre to the north eastward at the beginning of it, and yet according to the latter part of it, and to the Collector's report, it must have passed to the southward. I suppose these anomalies in the direction of the wind, as well as any which may have occurred in the direction of the storm,—for I take the Lighthouse-keeper's report to be the correct one, as to the direction of the wind, which as a seaman he was most likely to estimate correctly—to have been owing either to irregularities which *do* occur near the centres, or to have been caused by the deflection of the first efforts of the wind against the chain of the Rajamundry hills, to the northward, and not far inland, against which, the direct line of the storm from seaward was impinging, and by the opening of the valley of the Godavery. From the log of the "Indian Queen," I have placed the centre at noon about where it is marked,

and I take it to have passed over the meridian of Coringa, to the southward, and at a very short distance, about midnight of the 16th and 17th, or early in the morning of the 17th. We have no farther news of it inland. Samulcottah, from which some reports are dated, is about fifteen miles north of Coringa, but within 7 or 8 of the coast. I wrote to the Collector of Coringa for further information as to the storm inland, but have no reply. By the Lighthouse-keeper's report, we find the rise of the river to have begun at 2 P.M. of the 16th. Now as this was owing to the damming up of its waters by those of the sea, and not to any inland fall of rain,—for the inundation was one of *salt* water, a wave, or rise, forced in over a low country—we may suppose this to have a little preceded the vortex, which thus becomes, as I have made it, one of about 150 miles in diameter. This agrees with the position of the “Arethusa,” which vessel we find at this time bearing up at 6 A.M. with fine weather, and the wind at SE. at noon, being out of the storm.

I trust that to those who will take the trouble to follow these observations, referring to the diagrams which are upon the same scale as the chart, will be satisfied that there is as good evidence as the nature of things will allow, for the track which I have assigned for this storm.

II. *The size of the vortex.*

It will be seen by the chart and diagrams, that this is a remarkable instance of a storm *decreasing* in size as it progresses, but apparently *increasing* in violence. The diagram of the 13th, No. II, where we have the “Ganges” with a severe gale at ENE; the “Balguerie” with it at SW., and the “Bedford” at ESE.; all with their positions well ascertained, and including thus 22 points, or $\frac{2}{3}$ ds of the compass, may be taken I think, as a fair instance of a circular storm, about 300 miles in diameter. That of the 16th where, though the hurricane—for it certainly *was* one there—had just left the “Arethusa,” “Rosalind” and “Ripley” a few hours, was but just touching Coringa, Vizagapatam, and Samulcottah, and had fairly begun with the “Indian Queen,” may be taken as proof that it had then contracted to about 150 miles, and was blowing with much greater violence. There is no instance in this hurricane of any vessel having been becalmed while the centre of the vortex was passing; so that we must either suppose that there was no calm at the centre, or that no vessel passed directly through it. This is a distinction worth being borne in mind for future guidance.

III. *The rate of progression of the Storm.*

If our centres are correctly laid down, we find that the storm must have advanced from the 12th to the 13th about 150 miles,

13th	..	14th	..	159
14th	..	15th	..	62
15th	..	16th	..	160
16th	..	17th	..	123

Total, 654 miles in five days
or 131 miles per day—or about $5\frac{1}{2}$ miles per hour, on a line about N. 71 W. a rate which does not very greatly exceed that of the storm of June. The apparent check in the rate of motion between the 14th and 15th, if it really occurred, is curious. The centres on those days are tolerably well ascertained, and I should be inclined to suppose them, as correct as the others.

I cannot close this second memoir, without repeating that from every officer connected with Government, and from most of the mercantile community, I have met with the most zealous assistance. The Marine Board, through their indefatigable secretary, Mr. Greenlaw, the Bankshall, through Captain Clapperton, and Captain Biden, Master Attendant at Madras,—to whose kind attentions I shall have particularly to refer in a future memoir,—have all vied with each other in forwarding the collection of materials for me; and indeed, though it is strange to say it, the only class of persons whose co-operation was especially necessary, and who were somewhat dilatory in according it, is that for whose especial use and benefit it is intended!—the commanders of ships! To this however there are, I am happy to say, some very honorable exceptions; and I trust that as the uses, objects, and success of our inquiries become more evident, we shall have less reason to complain on this score. The negligent commanders may reflect that there can be no harm done, in giving us the information; and to get safe off when others are dismasted, always reflects some credit; while, on the other hand, the most careful man may have his reputation and his prospects injured by a succession of misfortunes; against which the best safeguard is the knowledge we are trying to elicit.
